

AMENDMENT

Please amend claim 55 as follows:

Claim 55 (currently amended). A semiconductor light source for emitting light to illuminate a space used by humans, the semiconductor light source comprising:

- an enclosure, said enclosure being fabricated from a material substantially transparent to white light,
- a base to which said enclosure is mounted,
- an interior volume within said enclosure,
- a secondary heat sink located in said interior volume, said secondary heat sink being capable of drawing heat from one or more semiconductor devices,
 - a plurality of primary heat sinks mounted on said secondary heat sink, each of said primary heat sinks being smaller than said secondary heat sink,
- a semiconductor chip capable of emitting light mounted on one of said primary heat sinks, said semiconductor chip being capable of emitting monochromatic light, said semiconductor chip being selected from the group consisting of light emitting diodes, light emitting diode arrays, laser chips, and VCSEL chips,
 - said chip including a substrate on which epitaxial layers are grown,
 - a buffer layer located on said substrate, said buffer layer serving to mitigate differences in material properties between said substrate and other epitaxial layers,
 - a first cladding layer serving to confine electron movement within the chip, said first cladding layer being adjacent said buffer layer,
 - an active layer, said active layer emitting light when electrons jump to a valance state,
 - a second cladding layer, said second cladding layer positioned so that said active layer lies between cladding layers,
 - a first and a second reflective layer, each of said first and second reflective layers being located on opposite sides of said active layer, said reflective layers serving to reflect light emitted by said active layer, said reflective layers including multiple quantum wells,

a contact layer on which an electron may be mounted for powering said chip, and
a coating for converting monochromatic light emitted by said chip to white light, and
a plurality of mounting panels located on said secondary heat sink, said primary heat
sinks being mounted to said mounting panels on said secondary heat sink, said mounting
panels on said secondary heat sink being arranged so that light emitted by semiconductor chips
located on said primary heat sinks which are located on said mounting panels is dispersed in a
desired direction.

Please amend claim 66 as follows:

Claim 66 (currently amended). A semiconductor light source for emitting light to illuminate
a space used by humans, the semiconductor light source comprising:

an enclosure, said enclosure being fabricated from a material substantially transparent
to white light,

a base to which said enclosure is mounted,

an interior volume within said enclosure,

a secondary heat sink located in said interior volume, said secondary heat sink being
capable of drawing heat from one or more semiconductor devices,

a plurality of primary heat sinks mounted on said secondary heat sink, each of
said primary heat sinks being smaller than said secondary heat sink,

a plurality of wells, said wells being located on said primary heat sinks and being
sized to accommodate mounting of a semiconductor chip therein,

a semiconductor chip capable of emitting light mounted in one of said primary heat sink
wells, said semiconductor chip being capable of emitting monochromatic light,

a quantity of adhesive serving to secure said chip to said primary heat sink,

said chip including a substrate on which epitaxial layers are grown,

a buffer layer located on said substrate, said buffer layer serving to mitigate differences
in material properties between said substrate and other epitaxial layers,

a first cladding layer serving to confine electron movement within the chip, said first

cladding layer being adjacent said buffer layer,

an active layer, said active layer emitting light when electrons jump to a valance state,

a second cladding layer, said second cladding layer positioned so that said active layer lies between cladding layers, and

a contact layer,

a first and a second reflective layer, each of said first and second reflective layers being located on opposite sides of said active layer, said reflective layers serving to reflect light emitted by said active layer, said reflective layers including multiple quantum wells, and

a coating for converting monochromatic light emitted by said chip to white light;

a plurality of mounting panels located on said secondary heat sink, said primary heat sinks being mounted to said mounting panels on said secondary heat sink, said mounting panels on said secondary heat sink being arranged so that light emitted by semiconductor chips located on said primary heat sinks which are located on said mounting panels is dispersed in a desired direction,

an air passageway within said secondary heat sink, said air passageway having an air entry and an air exit, said air passageway permitting air to enter at said air entry, travel through said air passageway and depart through said air exit, in order to receive heat from said secondary heat sink and dissipate said heat into the atmosphere.

CLAIM LISTING

A complete listing of the claims is as follows:

Claims 1-54 (cancelled).

Claim 55 (currently amended). A semiconductor light source for emitting light to illuminate a space used by humans, the semiconductor light source comprising:

- an enclosure, said enclosure being fabricated from a material substantially transparent to white light,
- a base to which said enclosure is mounted,
- an interior volume within said enclosure,
- a secondary heat sink located in said interior volume, said secondary heat sink being capable of drawing heat from one or more semiconductor devices,
 - a plurality of primary heat sinks mounted on said secondary heat sink, each of said primary heat sinks being smaller than said secondary heat sink,
 - a semiconductor chip capable of emitting light mounted on one of said primary heat sinks, said semiconductor chip being capable of emitting monochromatic light, said semiconductor chip being selected from the group consisting of light emitting diodes, light emitting diode arrays, laser chips, and VCSEL chips,
 - said chip including a substrate on which epitaxial layers are grown,
 - a buffer layer located on said substrate, said buffer layer serving to mitigate differences in material properties between said substrate and other epitaxial layers,
 - a first cladding layer serving to confine electron movement within the chip, said first cladding layer being adjacent said buffer layer,
 - an active layer, said active layer emitting light when electrons jump to a valance state,
 - a second cladding layer, said second cladding layer positioned so that said active layer lies between cladding layers,
 - a first and a second reflective layer, each of said first and second reflective layers being located on opposite sides of said active layer, said reflective layers serving to reflect light

emitted by said active layer, said reflective layers including multiple quantum wells, a contact layer on which an electron may be mounted for powering said chip, ~~and~~ a coating for converting monochromatic light emitted by said chip to white light, and a plurality of mounting panels located on said secondary heat sink, said primary heat sinks being mounted to said mounting panels on said secondary heat sink, said mounting panels on said secondary heat sink being arranged so that light emitted by semiconductor chips located on said primary heat sinks which are located on said mounting panels is dispersed in a desired direction.

Claim 56 (previously submitted). A device as recited in claim 55 wherein said substrate is selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb, InAs.

Claim 57 (previously submitted). A device as recited in claim 55 wherein said substrate is electrically conductive.

Claim 58 (previously submitted). A device as recited in claim 55 wherein said substrate is electrically insulative.

Claim 59 (previously submitted). A device as recited in claim 55 wherein at least one of said epitaxial layers includes a material selected from the group consisting of GaN, AlGaIn, AlN, AlGaIn, GaInN, and GaInN.

Claim 60 (previously submitted). A device as recited in claim 55 further comprising a phosphor coating on said chip.

Claim 61 (previously submitted). A device as recited in claim 55 further comprising a power module for powering the light source, said power module including a fitting for installation in a traditional light bulb socket and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by a semiconductor devices.

Claim 62 (previously submitted). A device as recited in claim 55 wherein at least one of said heat sink includes a material selected from the group consisting of include copper, aluminum, silicon carbide, boron nitride natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compacts, diamond deposited through chemical vapor deposition and diamond deposited through physical vapor deposition.

Claim 63 (previously submitted). A device as recited in claim 55 further comprising a quantity of heat conductive adhesive located between said chip and said primary heat sink and serving to conduct heat from said chip to said primary heat sink.

Claim 64 (previously submitted). A device as recited in claim 55 further comprising a quantity of light reflective adhesive located between said chip and said primary heat sink.

Claim 65 (previously submitted). A device as recited in claim 55 wherein at least one of said reflective layers includes multiple quantum wells.

Claim 66 (currently amended). A semiconductor light source for emitting light to illuminate a space used by humans, the semiconductor light source comprising:

- an enclosure, said enclosure being fabricated from a material substantially transparent to white light,
- a base to which said enclosure is mounted,
- an interior volume within said enclosure,
- a secondary heat sink located in said interior volume, said secondary heat sink being capable of drawing heat from one or more semiconductor devices,
 - a plurality of primary heat sinks mounted on said secondary heat sink, each of said primary heat sinks being smaller than said secondary heat sink,
 - a plurality of wells, said wells being located on said primary heat sinks and being sized to accommodate mounting of a semiconductor chip therein,
 - a semiconductor chip capable of emitting light mounted in one of said primary heat sink

wells, said semiconductor chip being capable of emitting monochromatic light,
a quantity of adhesive serving to secure said chip to said primary heat sink,
said chip including a substrate on which epitaxial layers are grown,
a buffer layer located on said substrate, said buffer layer serving to mitigate differences
in material properties between said substrate and other epitaxial layers,
a first cladding layer serving to confine electron movement within the chip, said first
cladding layer being adjacent said buffer layer,
an active layer, said active layer emitting light when electrons jump to a valance state,
a second cladding layer, said second cladding layer positioned so that said active layer
lies between cladding layers, and
a contact layer,
a first and a second reflective layer, each of said first and second reflective layers being
located on opposite sides of said active layer, said reflective layers serving to reflect light
emitted by said active layer, said reflective layers including multiple quantum wells, and
a coating for converting monochromatic light emitted by said chip to white light;
a plurality of mounting panels located on said secondary heat sink, said primary heat
sinks being mounted to said mounting panels on said secondary heat sink, said mounting
panels on said secondary heat sink being arranged so that light emitted by semiconductor chips
located on said primary heat sinks which are located on said mounting panels is dispersed in a
desired direction,
an air passageway within said secondary heat sink, said air passageway having an air
entry and an air exit, said air passageway permitting air to enter at said air entry, travel through
said air passageway and depart through said air exit, in order to receive heat from said
secondary heat sink and dissipate said heat into the atmosphere.

Claim 67 (previously submitted). A device as recited in claim 66 wherein said substrate is
selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb, InAs.

Claim 68 (previously submitted). A device as recited in claim 66 wherein said substrate is
electrically conductive.

Claim 69 (previously submitted). A device as recited in claim 66 wherein said substrate is electrically insulative.

Claim 70 (previously submitted). A device as recited in claim 66 wherein at least one of said epitaxial layers includes a material selected from the group consisting of GaN, AlGa_N, AlN, AlGa_N, GaInN, and GaInN.

Claim 71 (previously submitted). A device as recited in claim 66 further comprising a phosphor coating on said chip.

Claim 72 (previously submitted). A device as recited in claim 66 further comprising a power module for powering the light source, said power module including a fitting for installation in a traditional light bulb socket and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by a semiconductor devices.

Claim 73 (previously submitted). A device as recited in claim 66 wherein at least one of said heat sink includes a material selected from the group consisting of include copper, aluminum, silicon carbide, boron nitride natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compacts, diamond deposited through chemical vapor deposition and diamond deposited through physical vapor deposition.

Claim 74 (previously submitted). A device as recited in claim 66 further comprising a quantity of heat conductive adhesive located between said chip and said primary heat sink and serving to conduct heat from said chip to said primary heat sink.

Claim 75 (previously submitted). A device as recited in claim 66 further comprising a quantity of light reflective adhesive located between said chip and said primary heat sink.

Claim 76 (previously submitted). A device as recited in claim 66 further comprising a cover